

CANADA-NEWFOUNDLAND WATER QUALITY MONITORING AGREEMENT

ORGANOCHLORINATED PESTICIDES AND POLYCHLORINATED BIPHENYLS IN WATER OF SELECTED NEWFOUNDLAND RIVERS



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St. John's, Newfoundland

Water Quality Branch
Inland Waters Directorate
Environment Canada
Moncton, New Brunswick

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IN WATER OF
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by

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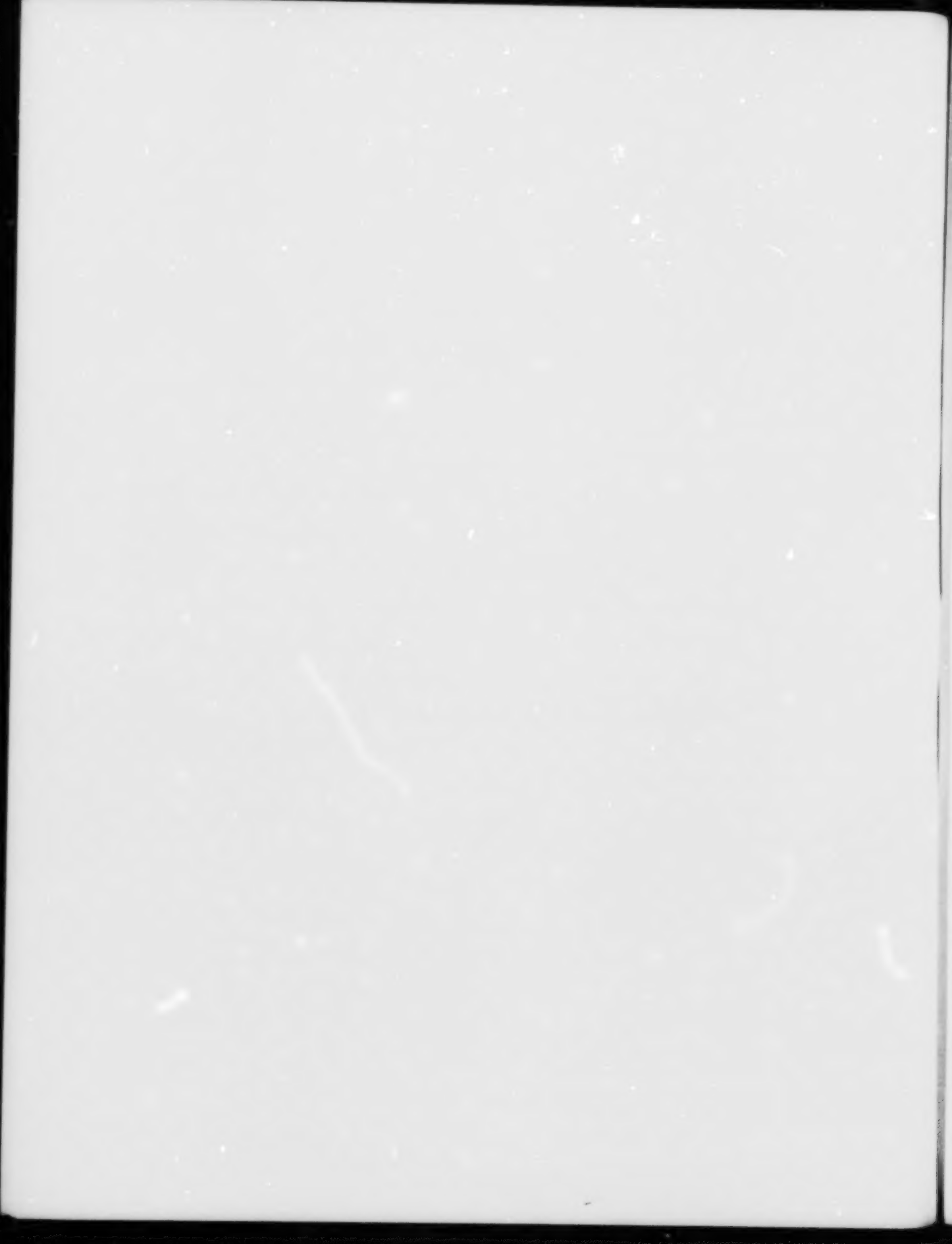
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ABSTRACT

From 1986 to 1988, selected Canada-Newfoundland Index Stations were sampled annually to measure the levels of organochlorine pesticides and polychlorinated biphenyls (OC-PCBs) in water. The ubiquitous alpha-BHC and lindane (or gamma-BHC) were present in trace amounts at most sites. High levels of PCBs were measured in many 1987 samples, but the results for 1986 and 1988 were almost all lower than the detection limit of 9.0 ng/L. Sources of BHC isomers are linked to precipitation, while high levels of PCBs in 1987 point to a random bottle/sample contamination.

RÉSUMÉ

De 1986 à 1988, 35 stations indicatrices du réseau Canada/Terre-Neuve de surveillance de la qualité des eaux furent choisies pour mesurer les quantités traces de pesticides organochlorés et de biphényles polychlorés dans l'eau. Les isomères du BHC omniprésents (alpha et gamma) furent détectés dans la majorité des échantillons. Des niveaux relativement élevés de biphényles polychlorés (BPC) furent mesurés dans plusieurs échantillons de 1987, tandis que ceux recueillis en 1986 et en 1988 avaient des niveaux de BPC presque toujours inférieurs à la limite de détection de 9.0 ng/L. Les isomères du BHC ont été associés à des concentrations mesurées dans la précipitation, et les hauts niveaux de BPC en 1987 semblent provenir d'une contamination par hasard de bouteilles et/ou d'échantillons.



INTRODUCTION

The Index Station Network of the Canada-Newfoundland Water Quality Monitoring Agreement consisted originally of 49 stations distributed throughout the Province of Newfoundland. Most of these stations were sampled monthly since August 1986, except for 10, that were sampled bimonthly. The regular parameter listing consists of physical parameters, major ions, heavy metals and nutrients in water samples only. Thirty-five stations were sampled annually from 1986 to 1988 for organochlorine pesticides and polychlorinated biphenyls (OC-PCBs) in water.

Data on OC-PCBs in water have now been gathered for a period of three years. This report examines the results available. In light of these results, recommendations are made regarding this monitoring component.

METHODS

a) Sampling Program

Thirty-five sites of the Index Station Network were selected for the measurement of OC-PCBs in water. Table 1 presents the station listing, and a corresponding map is given in Fig. 1. These stations were sampled annually, and were thus sampled three times from the implementation of the Canada-Newfoundland Water Quality Monitoring Agreement to 1988. For the first two years, sampling took place in November, while the last samples were collected in May 1988. Thus, data were gathered from the spring and fall periods.

b) Field Methodology

The containers used for sampling water for OC-PCBs analysis are 4L amber glass bottles with Teflon-lined caps. To prevent possible contamination of the sample, the interior of the caps were covered with aluminum foil except in 1987. In accordance to the protocol outlined in "Sampling for Water Quality" (WQB, 1983), the bottles were rinsed with tap water, chromic acid, organic-free water, washing acetone, special grade acetone, pesticide grade hexane and dried in a hot air oven at 360°C for at least one hour. In 1986, they were washed in Moncton, and the other years, they were washed in Burlington.

The sampling procedure used is described in "Sampling for Water Quality" (WQB, 1983). After collection, the samples were sent for analysis at the National Water Quality Laboratory in Burlington, Ontario.

c) Laboratory Methodology

The samples were kept at a temperature of 4°C until analysis. The procedure for the measurement of OC-PCBs involves an extraction with dichloromethane, followed by a concentration and fractionation on a silica gel column. Two fractions are collected which are then concentrated to desired volumes and injected into a capillary GC with EC detector. Verification of the positive results was done by GC-MS. The detection limit for the organochlorine pesticides is 0.4 ng/L, and for total PCBs is 9.0 ng/L. The parameter listing is shown in Table 2. Summarized descriptions of methods are given in WQB (1988).

d) Quality Assurance/Quality Control Aspects

Neither preservation blanks nor field spikes were prepared for the OC-PCBs samples, but sequential duplicate sampling was practiced at approximately 25% of the sites.

Other information on QA/QC is documented in the Canada-Newfoundland Technical Document (Technical Subcommittee, 1988).

RESULTS AND DISCUSSION

The results of OC-PCBs measured in water at stations belonging to the Index Station Network are presented in Table 3. The results for the 19 parameters are grouped by station.

For most parameters, the levels present at the sites were lower than the analytical method's detection limit. However, alpha-BHC, gamma-BHC and total PCBs were frequently detected in the samples (Table 3).

General trends in alpha-BHC were variable, but the values were almost always higher in November 1986 than in the following years (Table 3). The maximum value recorded was 8.61 ng/L at Humber River (00NF02YL0012), but it was still lower than the guideline of 10 ng/L established for the protection of freshwater life (CCREM, 1987). Previous toxic contaminant surveys have shown alpha-BHC detections in sub-basins 02YQ, 02YS and 02ZG of Newfoundland, but none in sub-basins 02ZK and 02ZN (detection limit = 1 ng/L) (O'Neill, 1988).

Gamma-BHC (or lindane) was detected in trace amounts at some sites, but not in a consistent manner over time (Table 3). Previous studies in Newfoundland failed to detect any lindane in water (O'Neill, 1988). However, the historical detection limit for lindane was 1 ng/L, while this study provided a detection limit of 0.4 ng/L. The majority of lindane concentrations measured were between 0.4 ng/L and 1 ng/L.

When looking at the river discharge data for selected stations (Fig. 2), the levels of alpha-BHC and lindane did not necessarily fluctuate with flow. In the past, it has been observed that alpha-BHC and lindane are often measured in Atlantic Region precipitation (Brun, 1985). The use of BHCs has been banned in Canada, so atmospheric transportation is responsible for the occurrences of these compounds in Newfoundland. Lindane has been used recently in Mexico and Latin America, and is still used in the United States and Europe (Rapaport and Eisenreich, 1988).

The detection of total PCBs in water samples from the Index Station Network caused some questioning of the data. Indeed, PCBs were detected at many stations, but only in 1987 (Table 3). A maximum PCB value of 57.5 ng/L was measured at the Northeast River station (00NF02ZK0005), but the value for its duplicate sample was only 9.5 ng/L. Heterogeneity of the duplicate samples implies either a sample contamination or non-homogeneity of the aliquot analyzed. The water quality guideline established for total PCBs for the protection of freshwater aquatic life is 1 ng/L (CCREM, 1987). This data indicates that 19 of the 35 stations had levels greater than the detection limit of 9.0 ng/L in 1987. Most detected values were only slightly above the detection limit.

The fact that PCBs were detected only in 1987 and that large differences were observed between the duplicate samples suggests that the bottles (containers) may have been randomly contaminated.

This assumption is also based on historical data from 1980 to 1987 for seven Newfoundland sub-basins (02YO, 02YR, 02ZG, 02ZJ, 02ZK, 02ZL AND 02ZM), that showed no traces of PCBs (O'Neill, 1988). The method used then had a slightly lower detection limit at 5 ng/L.

In addition, the bottles used during the 1987 sampling run were washed at the NWQL in Burlington instead of at the regional laboratory in Moncton. A review of the bottle preparation procedures revealed that the NWQL did not subject the bottles to certain aspects of the preparation protocol.

CONCLUSION

The occurrence of toxic organic contaminants in the Newfoundland rivers tested was generally rare. The only compounds frequently detected were alpha-BHC, gamma-BHC and total PCBs. The former two compounds have also been detected in Atlantic Region precipitation. Occurrences of alpha-BHC are also observed in historical surface water data in Newfoundland. Gamma-BHC, on the other hand, was not previously detected in Newfoundland surface water. However, the analytical method used at this time has a detection limit lower than that of the method used previously.

The fact that PCBs were detected in some samples collected in 1987, while no PCBs were detected in 1986 and 1988, indicates possible random bottle/sample contamination during that year. Since these results were confirmed by GC-MS, the contaminants were indeed PCBs (and not a PCB GC-ECD interference). Positive PCB results are indicative of non-compliance with the Canadian guideline for the protection of freshwater aquatic life set at 1 ng/L. For this reason, it may be justifiable to go back to the sites where PCBs were detected, and conduct follow up work.

RECOMMENDATIONS

In light of the data gathered during this study on the occurrence of OC-PCBs in Newfoundland, the following is recommended:

- (1) Yearly monitoring of OC-PCBs should be discontinued for five years. After this period, surface water sampling should again be conducted to verify the evolution of OC-PCBs contaminants.
- (2) The sites where PCBs were detected in 1987, even though sample/bottle contamination is suspected, should be further investigated. In these basins, it is suggested that another sample medium such as sediments or fish also be used.
- (3) Resources freed up by the discontinuation of this work should be used to undertake the work in (2) and, also, to screen for other basin specific organic contaminants in water and/or other aquatic media.

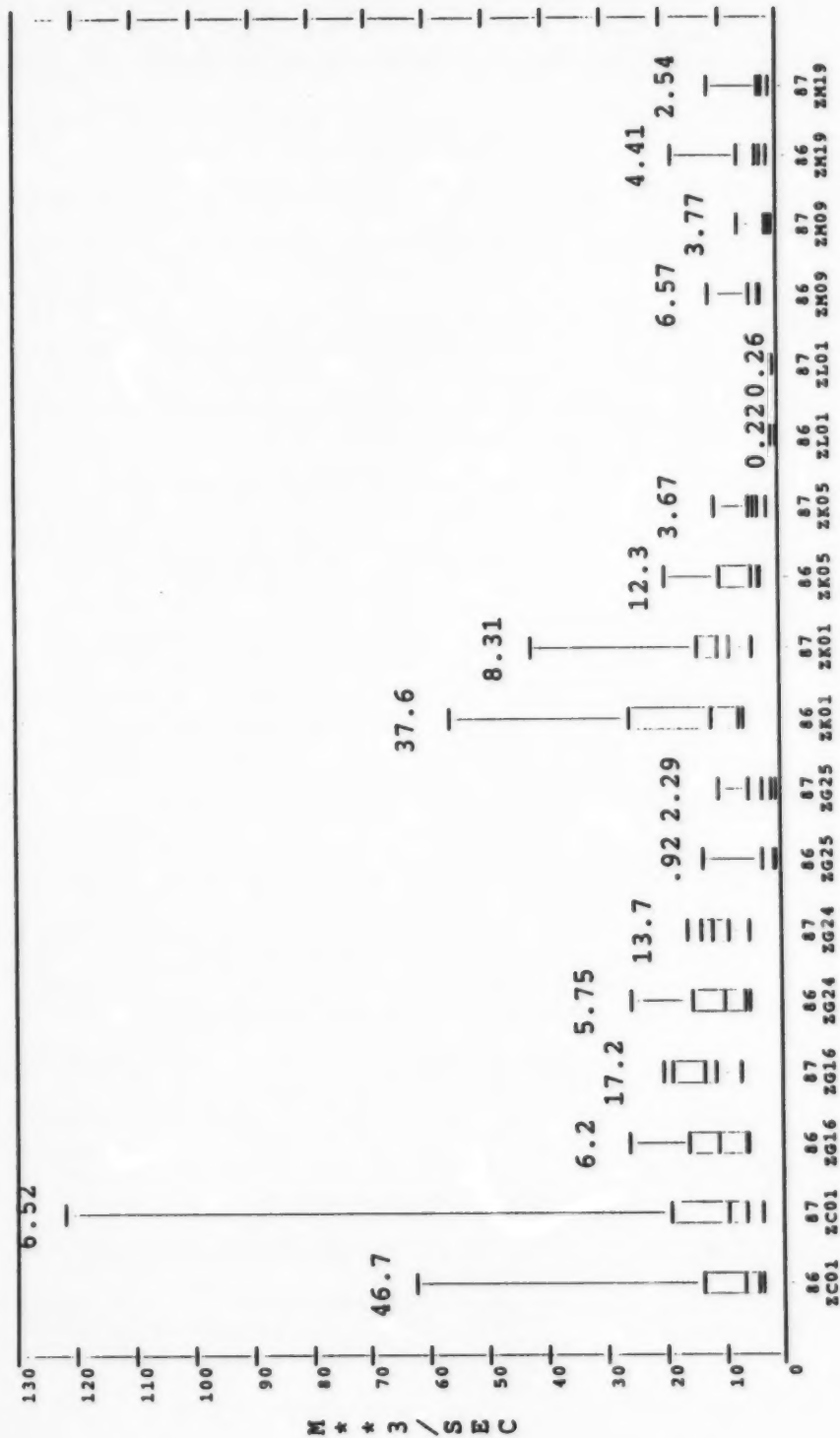
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**FIGURE 1 CANADA-NEWFOUNDLAND AGREEMENT
INDEX STATIONS SAMPLED FOR OC - PCB's**



FIG. 2. SUMMARY RESULTS OF DISCHARGE VALUES IN RIVERS OF NEWFOUNDLAND
FOR NOVEMBER 1986 AND NOVEMBER 1987



NOVEMBER

NOTE: THE NUMBERS ABOVE THE BOXPLOTS REPRESENT THE DAILY MEAN
DISCHARGE OF THE DAY THE WATER QUALITY SAMPLE WAS TAKEN

TABLE 1: List of the Canada/Newfoundland Agreement Index Stations Sampled for Organochlorines-PCB's under Different Sampling Regions (corresponding map in Fig. 1)

<u>Station #</u>	<u>Description</u>	<u>Designation</u>
a) <u>Western Newfoundland</u>		
1. 00NF02YC0002	Torrent River at bridge, Route 430	F-P
2. 00NF02YJ0001	Harry's River at bridge on Harmon Highway (Route 460)	F-P
3. 00NF02YL0012	Humber River at Humber River Bridge	F-P
4. 00NF02YE0005	Western Brook at bridge, Route 430	F
5. 00NF02YH0018	Lomond River at bridge, Route 431	F
6. 00NF02YE0004	Portland Creek at bridge, Route 430	P
7. 00NF02YG0001	Main River at bridge, Route 430	P
8. 00NF02YL0013	Corner Brook at bridge, O'Connel Drive, Corner Brook	P
9. 00NF02ZA0006	Grand Codroy River, 50 m below Overfall Brook	P
10. 00NF02ZA0007	Crabbes River at railway bridge	P
11. 00NF02ZC0011	Grandy Brook at Burgeo Road	P
b) <u>Northeastern Newfoundland</u>		
12. 00NF02YO0021	Exploits River at Bishops Falls	F-P
13. 00NF02YQ0005	Gander River, 1 km downstream of First Pond	F-P
14. 00NF02YM0003	Indian Brook at highway bridge, Route 390	F
15. 00NF02YS0001	Terra Nova River, at railway bridge in Terra Nova Lake channel	F

<u>Station #</u>	<u>Description</u>	<u>Designation</u>
b) <u>Northeastern Newfoundland</u> (Cont'd)		
16. 00NF02YS0010	Bread Cove Brook at Trans Canada Highway	F
17. 00NF02YM0004	Southwest Brook, Baie Verte	P
18. 00NF02YR0001	Pound Cove Brook at Route 320	P
19. 00NF02YS0005	Southwest Brook at Trans Canada Highway, Terra Nova National Park	P
20. 00NF02ZJ0024	Southern Bay River at old railway bridge	P
c) <u>Southeastern Newfoundland</u>		
21. 00NF02ZK0001	Rocky River, northwest of Colinet	F-P
22. 00NF02ZK0005	Northeast River from bridge off Highway 100	F-P
23. 00NF02ZG0016	Garnish River, 3 km southeast of Garnish	F
24. 00NF02ZH0010	Pipers Hole River, 7.5 km northeast of Swift Current	F
25. 00NF02ZG0024	Tides Brook 4.3 km southeast of Winterland	P
26. 00NF02ZG0025	Rattle Brook, south branch	P
27. 00NF02ZL0001	Spout Cove Brook, 3 km southwest of Kingston	P
28. 00NF02ZL0002	Hearts Content River, 4.3 km southeast of Hearts Content	P
29. 00NF02ZM0009	Waterford River at Kilbride	P
30. 00NF02ZM0015	Quidi Vidi Lake outlet at St. John's from Boulevard Bridge	P
31. 00NF02ZM0017	Raymond Brook in Goulds	P
32. 00NF02ZM0018	Mobile River at Mobile	P

<u>Station #</u>	<u>Description</u>	<u>Designation</u>
c) <u>Southeastern Newfoundland</u> (Cont'd)		
33. 00NF02ZM0019	Seal Cove River, 2.5 km southwest of Cappahayden	P
34. 00NF02ZM0020	Broad Cove Brook at St. Phillips	P
35. 00NF02ZN0004	Salmonier River at St. Catherine's	P

TABLE 2: Listing of the OC-PCB's measured in water samples of the Index Basin Network

<u>NAQUADAT</u>	<u>DESCRIPTION</u>	<u>DETECTION LIMIT</u>
17814L	Hexachloro-Benzene	0.4 ng/L
18081L	Alpha-BHC	0.4 ng/L
18083L	Gamma-BHC/Lindane	0.4 ng/L
18039L	Heptachlor	0.4 ng/L
18134L	Aldrin	0.4 ng/L
18044L	Heptachlor Epoxide	0.4 ng/L
18064L	Gamma-Chlordane	0.4 ng/L
18059L	Alpha-Chlordane	0.4 ng/L
18085L	Alpha-Endosulfan	0.4 ng/L
18029L	PP-DDE	0.4 ng/L
18154L	Head/Dieldrin	0.4 ng/L
18144L	Endrin	0.4 ng/L
18027L	OP-DDT	0.4 ng/L
18013L	PP-TDE	0.4 ng/L
18038L	PP-DDT	0.4 ng/L
18087L	Beta-Endosulfan	0.4 ng/L
18127L	Mirex	0.4 ng/L
18035L	Methoxy-Chlor	0.4 ng/L
18158L	Total PCB's	9.0 ng/L

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	HCB	a-BHC	g-BHC LINDANE	HEPTA- CHLOR	ALDRIN	HEPTACHLOR EPOXIDE	g-CHLORDANE
00NF02YC0002	705807	18-NOV-86	1330	L.40	2.42	L.40	L.40	L.40	L.40	L.40
00NF02YC0002	705808	18-NOV-86	1345	L.40	3.21	0.51	L.40	L.40	L.40	L.40
00NF02YC0002	705840	19-NOV-87	1445	L.4	2.00	L.4	L.4	L.4	L.4	L.4
00NF02YC0002	805123	18-MAY-88	1520	L.4	1.22	L.4	L.4	L.4	L.4	L.4
00NF02YC0002	805140	18-MAY-88	1525	L.4	1.28	L.4	L.4	L.4	L.4	L.4
00NF02YE0004	705809	18-NOV-86	1500	L.40	3.99	0.66	L.40	L.40	L.40	L.40
00NF02YE0004	705889	16-NOV-87	1550	L.4	5.30	0.60	L.4	L.4	L.4	L.4
00NF02YE0004	805125	19-MAY-88	1025	L.4	3.11	0.44	L.4	L.4	L.4	L.4
00NF02YE0005	705806	17-NOV-86	1450	L.40	3.64	0.54	L.40	L.40	L.40	L.40
00NF02YE0005	705887	16-NOV-87	1435	L.4	3.70	0.50	L.4	L.4	L.4	L.4
00NF02YE0005	705888	16-NOV-87	1440	L.4	5.20	0.50	L.4	L.4	L.4	L.4
00NF02YE0005	805127	19-MAY-88	1230	L.4	3.92	0.40	L.4	L.4	L.4	L.4
00NF02YG0001	705074	07-NOV-86	1315	L.40	4.34	0.49	L.40	L.40	L.40	L.40
00NF02YG0001	705882	09-NOV-87	1250	L.4	2.80	L.4	L.4	L.4	L.4	L.4
00NF02YG0001	805108	05-MAY-88	1310	L.4	0.90	L.4	L.4	L.4	L.4	L.4
00NF02YG0001	805109	05-MAY-88	1315	L.4	0.80	L.4	L.4	L.4	L.4	L.4
00NF02YH0018	705810	19-NOV-86	1215	L.40	2.35	L.40	L.40	L.40	L.40	L.40
00NF02YH0018	705885	16-NOV-87	1220	L.4	4.50	0.40	L.4	L.4	L.4	L.4
00NF02YH0018	705886	16-NOV-87	1225	L.4	1.00	L.4	L.4	L.4	L.4	L.4
00NF02YH0018	805121	18-MAY-88	1030	L.4	1.25	L.4	L.4	L.4	L.4	L.4
00NF02YJ0001	705075	10-NOV-86	1300	L.40	2.02	L.40	L.40	L.40	L.40	L.40
00NF02YJ0001	705076	10-NOV-86	1305	L.40	1.83	L.40	L.40	L.40	L.40	L.40
00NF02YJ0001	705878	04-NOV-87	1135	L.4	0.80	L.4	L.4	L.4	L.4	L.4
00NF02YJ0001	805111	03-MAY-88	1140	L.4	0.90	L.4	L.4	L.4	L.4	L.4
00NF02YJ0001	805112	03-MAY-88	1145	L.4	1.00	0.50	L.4	L.4	L.4	L.4
00NF02YL0012	705073	06-NOV-86	1115	L.40	8.61	0.64	L.40	L.40	L.40	L.40
00NF02YL0012	705883	09-NOV-87	1535	L.4	5.80	0.50	L.4	L.4	L.4	L.4
00NF02YL0012	705884	09-NOV-87	1540	L.4	2.10	L.4	L.4	L.4	L.4	L.4
00NF02YL0012	805110	05-MAY-88	1600	L.4	0.80	0.40	L.4	L.4	L.4	L.4
00NF02YL0013	705811	24-NOV-86	1320	L.40	4.18	0.66	L.40	L.40	L.40	L.40
00NF02YL0013	705812	24-NOV-86	1325	L.40	3.25	0.50	L.40	L.40	L.40	L.40
00NF02YL0013	705841	23-NOV-87	1120	L.4	1.20	L.4	L.4	L.4	L.4	L.4
00NF02YL0013	805129	20-MAY-88	1155	L.4	1.01	L.4	L.4	L.4	L.4	L.4
00NF02YL0013	805130	20-MAY-88	1200	L.4	1.07	L.4	L.4	L.4	L.4	L.4
00NF02YM0003	705025	12-NOV-86	1415	L.40	4.81	L.40	L.40	L.40	L.40	L.40
00NF02YM0003	705742	03-NOV-87	1150	L.4	0.40	L.4	L.4	L.4	L.4	L.4
00NF02YM0003	805100	02-MAY-88	1545	L.4	0.60	L.4	L.4	L.4	L.4	L.4
00NF02YM0003	805101	02-MAY-88	1550	L.4	0.70	L.4	L.4	L.4	L.4	L.4

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	a-CHLOR- DANE	a-ENDO- SULFAN	PF-DDE	HEOD/ DIELDRIN	ENDRIN	OP-DDT	PP-TDE
00NF02YC0002	705807	18-NOV-86	1330	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YC0002	705808	18-NOV-86	1345	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YC0002	705840	19-NOV-87	1445	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YC0002	805123	18-MAY-88	1520	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YC0002	805140	18-MAY-88	1525	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YE0004	705809	18-NOV-86	1500	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YE0004	705889	16-NOV-87	1550	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YE0004	805125	19-MAY-88	1025	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YE0005	705806	17-NOV-86	1450	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YE0005	705887	16-NOV-87	1435	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YE0005	705888	16-NOV-87	1440	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YE0005	805127	19-MAY-88	1230	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YG0001	705074	07-NOV-86	1315	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YG0001	705882	09-NOV-87	1250	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YG0001	805108	05-MAY-88	1310	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YG0001	805109	05-MAY-88	1315	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YH0018	705810	19-NOV-86	1215	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YH0018	705885	16-NOV-87	1220	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YH0018	705886	16-NOV-87	1225	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YH0018	805121	18-MAY-88	1030	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YJ0001	705075	10-NOV-86	1300	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YJ0001	705076	10-NOV-86	1305	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YJ0001	705878	04-NOV-87	1135	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YJ0001	805111	03-MAY-88	1140	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YJ0001	805112	03-MAY-88	1145	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YL0012	705073	06-NOV-86	1115	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YL0012	705883	09-NOV-87	1535	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YL0012	705884	09-NOV-87	1540	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YL0012	805110	05-MAY-88	1600	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YL0013	705811	24-NOV-86	1320	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YL0013	705812	24-NOV-86	1325	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YL0013	705841	23-NOV-87	1120	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YL0013	805129	20-MAY-88	1155	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YL0013	805130	20-MAY-88	1200	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YM0003	705025	12-NOV-86	1415	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YM0003	705742	03-NOV-87	1150	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YM0003	805100	02-MAY-88	1545	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YM0003	805101	02-MAY-88	1550	L.4	L.4	L.4	L.4	L.4	L.4	L.4

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	PP-DDT	b-ENDO SULFAN	MIREX	METHOXY CHLOR	TOTAL PCB'S
00NF02YC0002	705807	18-NOV-86	1330	L.40	L.40	L.40	L.40	L9.00
00NF02YC0002	705808	18-NOV-86	1345	L.40	L.40	L.40	L.40	L9.00
00NF02YC0002	705840	19-NOV-87	1445	L.4	L.4	L.4	L.4	9.4
00NF02YC0002	805123	18-MAY-88	1520	L.4	L.4	L.4	L.4	L9.0
00NF02YC0002	805140	18-MAY-88	1525	L.4	L.4	L.4	L.4	L9.0
00NF02YE0004	705809	18-NOV-86	1500	L.40	L.40	L.40	L.40	L9.00
00NF02YE0004	705889	16-NOV-87	1550	L.4	L.4	L.4	L.4	12.4
00NF02YE0004	805125	19-MAY-88	1025	L.4	L.4	L.4	L.4	9.0
00NF02YE0005	705806	17-NOV-86	1450	L.40	L.40	L.40	L.40	L9.00
00NF02YE0005	705887	16-NOV-87	1435	L.4	L.4	L.4	L.4	11.4
00NF02YE0005	705888	16-NOV-87	1440	L.4	L.4	L.4	L.4	10.6
00NF02YE0005	805127	19-MAY-88	1230	L.4	L.4	L.4	L.4	L9.0
00NF02YG0001	705074	07-NOV-86	1315	L.40	L.40	L.40	L.40	L9.00
00NF02YG0001	705882	09-NOV-87	1250	L.4	L.4	L.4	L.4	L9.0
00NF02YG0001	805108	05-MAY-88	1310	L.4	L.4	L.4	L.4	L9.0
00NF02YG0001	805109	05-MAY-88	1315	L.4	L.4	L.4	L.4	L9.0
00NF02YH0018	705810	19-NOV-86	1215	L.40	L.40	L.40	L.40	L9.00
00NF02YH0018	705885	16-NOV-87	1220	L.4	L.4	L.4	L.4	L9.0
00NF02YH0018	705886	16-NOV-87	1225	L.4	L.4	L.4	L.4	9.3
00NF02YH0018	805121	18-MAY-88	1030	L.4	L.4	L.4	L.4	L9.0
00NF02YJ0001	705075	10-NOV-86	1300	L.40	L.40	L.40	L.40	L9.00
00NF02YJ0001	705076	10-NOV-86	1305	L.40	L.40	L.40	L.40	L9.00
00NF02YJ0001	705878	04-NOV-87	1135	L.4	L.4	L.4	L.4	L9.0
00NF02YJ0001	805111	03-MAY-88	1140	L.4	L.4	L.4	L.4	L9.0
00NF02YJ0001	805112	03-MAY-88	1145	L.4	L.4	L.4	L.4	L9.0
00NF02YL0012	705073	06-NOV-86	1115	L.40	L.40	L.40	L.40	L9.00
00NF02YL0012	705883	09-NOV-87	1535	L.4	L.4	L.4	L.4	L9.0
00NF02YL0012	705884	09-NOV-87	1540	L.4	L.4	L.4	L.4	L9.0
00NF02YL0012	805110	05-MAY-88	1600	L.4	L.4	L.4	L.4	L9.0
00NF02YL0013	705811	24-NOV-86	1320	L.40	L.40	L.40	L.40	L9.00
00NF02YL0013	705812	24-NOV-86	1325	L.40	L.40	L.40	L.40	L9.00
00NF02YL0013	705841	23-NOV-87	1120	L.4	L.4	L.4	L.4	9.1
00NF02YL0013	805129	20-MAY-88	1155	L.4	L.4	L.4	L.4	L9.0
00NF02YL0013	805130	20-MAY-88	1200	L.4	L.4	L.4	L.4	L9.0
00NF02YM0003	705025	12-NOV-86	1415	L.40	L.40	L.40	L.40	L9.00
00NF02YM0003	705742	03-NOV-87	1150	L.4	L.4	L.4	L.4	L9.0
00NF02YM0003	805100	02-MAY-88	1545	L.4	L.4	L.4	L.4	L9.0
00NF02YM0003	805101	02-MAY-88	1550	L.4	L.4	L.4	L.4	L9.0

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	HCB	a-BHC	g-BHC LINDANE	HEPTA- CHLOR	ALDRIN	HEPTACHLOR EPOXIDE	g-CHLORDANE
00NF02YM0004	705024	12-NOV-86	1200	L.40	2.80	L.40	L.40	L.40	L.40	L.40
00NF02YM0004	705740	02-NOV-87	1250	L.4	0.50	L.4	L.4	L.4	L.4	L.4
00NF02YM0004	705741	02-NOV-87	1255	L.4	1.90	L.4	L.4	L.4	L.4	L.4
00NF02YM0004	805097	02-MAY-88	1235	L.4	0.40	L.4	L.4	L.4	L.4	L.4
00NF02YD0021	705798	17-NOV-86	1530	L.40	4.07	0.69	L.40	L.40	L.40	L.40
00NF02YD0021	705799	17-NOV-86	1535	L.40	4.83	0.89	L.40	L.40	L.40	L.40
00NF02YD0021	705744	04-NOV-87	1355	L.4	2.90	L.4	L.4	L.4	L.4	L.4
00NF02YD0021	805099	05-MAY-88	1355	L.4	1.30	L.4	L.4	L.4	L.4	L.4
00NF02YD0005	705803	21-NOV-86	1400	L.40	4.09	0.58	L.40	L.40	L.40	L.40
00NF02YD0005	705839	17-NOV-87	1400	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YD0005	805150	17-MAY-88	1150	L.4	3.24	L.4	L.4	L.4	L.4	L.4
00NF02YD0005	805151	17-MAY-88	1155	L.4	3.26	L.4	L.4	L.4	L.4	L.4
00NF02YR0001	705804	24-NOV-86	1340	L.40	2.84	0.41	L.40	L.40	L.40	L.40
00NF02YR0001	705805	24-NOV-86	1345	L.40	3.23	0.46	L.40	L.40	L.40	L.40
00NF02YR0001	705832	23-NOV-87	1220	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YR0001	805153	25-MAY-88	1220	L.4	1.06	L.4	L.4	L.4	L.4	L.4
00NF02YR0001	805154	25-MAY-88	1225	L.4	1.25	L.4	L.4	L.4	L.4	L.4
00NF02YS0005	705801	19-NOV-86	1430	L.40	1.21	L.40	L.40	L.40	L.40	L.40
00NF02YS0005	705835	24-NOV-87	1350	L.4	0.90	L.4	L.4	L.4	L.4	L.4
00NF02YS0005	705836	24-NOV-87	1355	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0005	805156	26-MAY-88	1450	L.4	0.62	L.4	L.4	L.4	L.4	L.4
00NF02YS0010	705800	19-NOV-86	1200	L.40	4.41	0.72	L.40	L.40	L.40	L.40
00NF02YS0010	705833	24-NOV-87	1220	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0010	705834	24-NOV-87	1225	L.4	1.70	L.4	L.4	L.4	L.4	L.4
00NF02YS0010	805155	26-MAY-88	1305	L.4	1.79	L.4	L.4	L.4	L.4	L.4
00NF02YS0011	705802	20-NOV-86	1230	L.40	4.62	1.18	L.40	L.40	L.40	L.40
00NF02YS0011	705830	19-NOV-87	1505	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0011	705831	19-NOV-87	1510	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0011	805152	19-MAY-88	1155	L.4	2.27	0.45	L.4	L.4	L.4	L.4
00NF02ZA0006	705069	05-NOV-86	1340	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZA0006	705070	05-NOV-86	1355	L.40	1.52	L.40	L.40	L.40	L.40	L.40
00NF02ZA0006	705881	04-NOV-87	1500	L.4	0.60	L.4	L.4	L.4	L.4	L.4
00NF02ZA0006	805106	03-MAY-88	1700	L.4	0.70	0.60	L.4	L.4	L.4	L.4
00NF02ZA0006	805107	03-MAY-88	1705	L.4	0.60	0.50	L.4	L.4	L.4	L.4
00NF02ZA0003	705072	05-NOV-86	1620	L.40	2.96	L.40	L.40	L.40	L.40	L.40
00NF02ZA0007	705379	04-NOV-87	1320	L.4	2.10	L.4	L.4	L.4	L.4	L.4
00NF02ZA0007	705880	04-NOV-87	1325	L.4	1.60	L.4	L.4	L.4	L.4	L.4
00NF02ZA0007	805113	03-MAY-88	1415	L.4	0.80	L.4	L.4	L.4	L.4	L.4

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	a-CHLOR- DANE	a-ENDO- SULFAN	PP-DDE	HEOD/ DIELDRIN	ENDRIN	OP-DDT	PP-TDE
00NF02YM0004	705024	12-NOV-86	1200	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YM0004	705740	02-NOV-87	1250	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YM0004	705741	02-NOV-87	1255	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YM0004	805097	02-MAY-88	1235	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02Y00021	705798	17-NOV-86	1530	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02Y00021	705799	17-NOV-86	1535	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02Y00021	705744	04-NOV-87	1355	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02Y00021	805099	05-MAY-88	1355	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02Y00005	705803	21-NOV-86	1400	L.40	L.40	L.4	L.40	L.40	L.40	L.40
00NF02Y00005	705839	17-NOV-87	1400	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02Y00005	805150	17-MAY-88	1150	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02Y00005	805151	17-MAY-88	1155	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YR0001	705804	24-NOV-86	1340	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YR0001	705805	24-NOV-86	1345	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YR0001	705832	27-NOV-87	1220	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YR0001	805153	25-MAY-88	1220	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YR0001	805154	25-MAY-88	1225	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0005	705801	19-NOV-86	1430	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YS0005	705835	24-NOV-87	1350	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0005	705836	24-NOV-87	1355	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0005	805156	26-MAY-88	1450	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0010	705800	19-NOV-86	1200	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YS0010	705833	24-NOV-87	1220	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0010	705834	24-NOV-87	1225	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0010	805155	26-MAY-88	1305	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0011	705802	20-NOV-86	1230	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02YS0011	705830	19-NOV-87	1505	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0011	705831	19-NOV-87	1510	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02YS0011	805152	19-MAY-88	1155	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZA0006	705069	05-NOV-86	1340	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZA0006	705070	05-NOV-86	1355	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZA0006	705881	04-NOV-87	1500	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZA0006	805106	03-MAY-88	1700	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZA0006	805107	03-MAY-88	1705	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZA0003	705072	05-NOV-86	1620	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZA0007	705879	04-NOV-87	1320	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZA0007	705880	04-NOV-87	1325	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZA0007	805113	03-MAY-88	1415	L.4	L.4	L.4	L.4	L.4	L.4	L.4

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	PP-DDT	b-ENDO SULFAN	MIREX	METHOXY CHLOR	TOTAL PCB'S
00NF02YM0004	705024	12-NOV-86	1200	L.40	L.40	L.40	L.40	L9.00
00NF02YM0004	705740	02-NOV-87	1250	L.4	L.4	L.4	L.4	11.0
00NF02YM0004	705741	02-NOV-87	1255	L.4	L.4	L.4	L.4	13.5
00NF02YM0004	805097	02-MAY-88	1235	L.4	L.4	L.4	L.4	L9.0
00NF02YD0021	705798	17-NOV-86	1530	L.40	L.40	L.40	L.40	L9.00
00NF02YD0021	705799	17-NOV-86	1535	L.40	L.40	L.40	L.40	L9.00
00NF02YD0021	705744	04-NOV-87	1353	L.4	L.4	L.4	L.4	14.0
00NF02YD0021	805099	05-MAY-88	1355	L.4	L.4	L.4	L.4	L9.0
00NF02YQ0005	705803	21-NOV-86	1400	L.40	L.40	L.40	L.40	L9.00
00NF02YQ0005	705839	17-NOV-87	1400	L.4	L.4	L.4	L.4	L9.0
00NF02YQ0005	805150	17-MAY-88	1150	L.4	L.4	L.4	L.4	L9.0
00NF02YQ0005	805151	17-MAY-88	1155	L.4	L.4	L.4	L.4	L9.0
00NF02YR0001	705804	24-NOV-86	1340	L.40	L.40	L.40	L.40	L9.00
00NF02YR0001	705805	24-NOV-86	1345	L.40	L.40	L.40	L.40	L9.00
00NF02YR0001	705832	23-NOV-87	1220	L.4	L.4	L.4	L.4	L9.0
00NF02YR0001	805153	25-MAY-88	1220	L.4	L.4	L.4	L.4	L9.0
00NF02YR0001	805154	25-MAY-88	1225	L.4	L.4	L.4	L.4	L9.0
00NF02YS0005	705801	19-NOV-86	1430	L.40	L.40	L.40	L.40	L9.00
00NF02YS0005	705835	24-NOV-87	1350	L.4	L.4	L.4	L.4	L9.0
00NF02YS0005	705836	24-NOV-87	1355	L.4	L.4	L.4	L.4	9.8
00NF02YS0005	805156	26-MAY-88	1450	L.4	L.4	L.4	L.4	L9.0
00NF02YS0010	705800	19-NOV-86	1200	L.40	L.40	L.40	L.40	L9.00
00NF02YS0010	705833	24-NOV-87	1220	L.4	L.4	L.4	L.4	10.9
00NF02YS0010	705834	24-NOV-87	1225	L.4	L.4	L.4	L.4	L9.0
00NF02YS0010	805155	26-MAY-88	1305	L.4	L.4	L.4	L.4	L9.0
00NF02YS0011	705802	20-NOV-86	1230	L.40	L.40	L.40	L.40	L9.00
00NF02YS0011	705830	19-NOV-87	1505	L.4	L.4	L.4	L.4	14.5
00NF02YS0011	705831	19-NOV-87	1510	L.4	L.4	L.4	L.4	L9.0
00NF02YS0011	805152	19-MAY-88	1155	L.4	L.4	L.4	L.4	L9.0
00NF02ZA0006	705069	05-NOV-86	1340	L.40	L.40	L.40	L.40	L9.00
00NF02ZA0006	705070	05-NOV-86	1355	L.40	L.40	L.40	L.40	L9.00
00NF02ZA0006	705881	04-NOV-87	1500	L.4	L.4	L.4	L.4	L9.0
00NF02ZA0006	805106	03-MAY-88	1700	L.4	L.4	L.4	L.4	L9.0
00NF02ZA0006	805107	03-MAY-88	1705	L.4	L.4	L.4	L.4	L9.0
00NF02ZA0007	705072	05-NOV-86	1620	L.40	L.40	L.40	L.40	L9.00
00NF02ZA0007	705879	04-NOV-87	1320	L.4	L.4	L.4	L.4	L9.0
00NF02ZA0007	705880	04-NOV-87	1325	L.4	L.4	L.4	L.4	L9.0
00NF02ZA0007	805113	03-MAY-88	1415	L.4	L.4	L.4	L.4	L9.0

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	MCB	a-BHC	g-BHC LINDANE	HEPTA- CHLOR	ALDRIN	HEPTACHLOR EPOXIDE	g-CHLORDANE
00NF02ZC0001	705813	26-NOV-86	1130	L.40	2.50	L.40	L.40	L.40	L.40	L.40
00NF02ZC0001	705842	17-NOV-87	1335	L.4	1.10	L.4	L.4	L.4	L.4	L.4
00NF02ZC0001	705843	17-NOV-87	1340	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZC0001	805116	16-MAY-88	1320	L.4	1.15	L.4	L.4	L.4	L.4	L.4
00NF02ZG0016	705795	05-NOV-86	1335	L.40	6.72	L.40	L.40	L.40	L.40	L.40
00NF02ZG0016	705746	03-NOV-87	1550	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZG0016	805170	19-MAY-88	1130	L.4	1.02	L.4	L.4	L.4	L.4	L.4
00NF02ZG0024	705791	05-NOV-86	1205	L.40	3.89	0.53	L.40	L.40	L.40	L.40
00NF02ZG0024	705747	03-NOV-87	1800	L.4	2.20	L.4	L.4	L.4	L.4	L.4
00NF02ZG0024	805171	19-MAY-88	945	L.4	1.37	L.4	L.4	L.4	L.4	L.4
00NF02ZG0025	705796	05-NOV-86	1600	L.40	5.63	0.41	L.40	L.40	L.40	L.40
00NF02ZG0025	705748	04-NOV-87	1005	L.4	2.80	L.4	L.4	L.4	L.4	L.4
00NF02ZG0025	805139	18-MAY-88	1610	L.4	1.46	L.4	L.4	L.4	L.4	L.4
00NF02ZH0010	705797	10-NOV-86	1235	L.40	4.08	L.40	L.40	L.40	L.40	L.40
00NF02ZH0010	705749	04-NOV-87	1215	L.4	4.00	0.70	L.4	L.4	L.4	L.4
00NF02ZH0010	805138	18-MAY-88	1310	L.4	1.57	L.4	L.4	L.4	L.4	L.4
00NF02ZJ0024	705027	13-NOV-86	1400	L.40	3.03	L.40	L.40	L.40	L.40	L.40
00NF02ZJ0024	705028	13-NOV-86	1405	L.40	2.43	L.40	L.40	L.40	L.40	L.40
00NF02ZJ0024	705745	05-NOV-87	1335	L.4	1.60	L.4	L.4	L.4	L.4	L.4
00NF02ZJ0024	805098	04-MAY-88	1350	L.4	0.70	L.4	L.4	L.4	L.4	L.4
00NF02ZK0001	705818	26-NOV-86	1510	L.40	2.95	L.40	L.40	0.72	L.40	L.40
00NF02ZK0001	705837	24-NOV-87	1540	L.4	0.80	L.4	L.4	L.4	L.4	L.4
00NF02ZK0001	805135	16-MAY-88	1400	L.4	0.97	L.4	L.4	L.4	L.4	L.4
00NF02ZK0005	705817	26-NOV-86	1150	L.40	2.62	L.40	L.40	L.40	L.40	L.40
00NF02ZK0005	705850	24-NOV-87	1320	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZK0005	705851	24-NOV-87	1330	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZK0005	805134	16-MAY-88	1135	L.4	1.03	L.4	L.4	L.4	L.4	L.4
00NF02ZL0001	705792	04-NOV-86	1310	L.40	3.90	L.40	L.40	L.40	L.40	L.40
00NF02ZL0001	705793	04-NOV-86	1315	L.40	5.42	L.40	L.40	L.40	L.40	L.40
00NF02ZL0001	705750	05-NOV-87	1210	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZL0001	805102	03-MAY-88	1335	L.4	0.60	L.4	L.4	L.4	L.4	L.4
00NF02ZL0002	705794	04-NOV-86	1415	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZL0002	705751	05-NOV-87	1330	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZL0002	705752	05-NOV-87	1335	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZL0002	805103	03-MAY-88	1500	L.4	0.50	L.4	L.4	L.4	L.4	L.4
00NF02ZH0009	705822	28-NOV-86	1600	L.40	1.09	0.69	L.40	L.40	L.40	L.40
00NF02ZH0009	705823	28-NOV-86	1605	L.40	1.28	0.68	L.40	L.40	L.40	L.40

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

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TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	PP-DDT	b-ENDO SULFAN	MIREX	METHOXY CHLOR	TOTAL PCB'S
00NF022C0001	705813	26-NOV-86	1130	L.40	L.40	L.40	L.40	L9.00
00NF022C0001	705842	17-NOV-87	1335	L.4	L.4	L.4	L.4	L9.0
00NF022C0001	705843	17-NOV-87	1340	L.4	L.4	L.4	L.4	L9.0
00NF022C0001	805116	16-MAY-88	1320	L.4	L.4	L.4	L.4	L9.0
00NF022G0016	705795	05-NOV-86	1335	L.40	L.40	L.40	L.40	L9.00
00NF022G0016	705746	03-NOV-87	1550	L.4	L.4	L.4	L.4	20.6
00NF022G0016	805170	19-MAY-88	1130	L.4	L.4	L.4	L.4	L9.0
00NF022G0024	705791	05-NOV-86	1205	L.40	L.40	L.40	L.40	L9.00
00NF022G0024	705747	03-NOV-87	1800	L.4	L.4	L.4	L.4	L9.0
00NF022G0024	805171	19-MAY-88	945	L.4	L.4	L.4	L.4	L9.0
00NF022G0025	705796	05-NOV-86	1600	L.40	L.40	L.40	L.40	L9.00
00NF022G0025	705748	04-NOV-87	1005	L.4	L.4	L.4	L.4	13.5
00NF022G0025	805139	18-MAY-88	1610	L.4	L.4	L.4	L.4	L9.0
00NF022H0010	705797	10-NOV-86	1235	L.40	L.40	L.40	L.40	L9.00
00NF022H0010	705749	04-NOV-87	1215	L.4	L.4	L.4	L.4	9.9
00NF022H0010	805138	18-MAY-88	1310	L.4	L.4	L.4	L.4	L9.0
00NF022J0024	705027	13-NOV-86	1400	L.40	L.40	L.40	L.40	L9.00
00NF022J0024	705028	13-NOV-86	1405	L.40	L.40	L.40	L.40	L9.00
00NF022J0024	705745	05-NOV-87	1335	L.4	L.4	L.4	L.4	9.0
00NF022J0024	805098	04-MAY-88	1350	L.4	L.4	L.4	L.4	L9.0
00NF022K0001	705818	26-NOV-86	1510	L.40	L.40	L.40	L.40	L9.00
00NF022K0001	705837	24-NOV-87	1540	L.4	L.4	L.4	L.4	L9.0
00NF022K0001	805135	16-MAY-88	1400	L.4	L.4	L.4	L.4	L9.0
00NF022K0005	705817	26-NOV-86	1150	L.40	L.40	L.40	L.40	L9.00
00NF022K0005	705850	24-NOV-87	1320	L.4	L.4	L.4	L.4	57.5
00NF022K0005	705851	24-NOV-87	1330	L.4	L.4	L.4	L.4	9.5
00NF022K0005	805134	16-MAY-88	1135	L.4	L.4	L.4	L.4	L9.0
00NF022L0001	705792	04-NOV-86	1310	L.40	L.40	L.40	L.40	L9.00
00NF022L0001	705793	04-NOV-86	1315	L.40	L.40	L.40	L.40	L9.00
00NF022L0001	705750	05-NOV-87	1210	L.4	L.4	L.4	L.4	10.1
00NF022L0001	805102	03-MAY-88	1335	L.4	L.4	L.4	L.4	L9.0
00NF022L0002	705794	04-NOV-86	1415	L.40	L.40	L.40	L.40	L9.00
00NF022L0002	705751	05-NOV-87	1330	L.4	L.4	L.4	L.4	12.3
00NF022L0002	705752	05-NOV-87	1335	L.4	L.4	L.4	L.4	9.1
00NF022L0002	805103	03-MAY-88	1500	L.4	L.4	L.4	L.4	L9.0
00NF022M0009	705822	28-NOV-86	1600	L.40	L.40	L.40	L.40	L9.00
00NF022M0009	705823	28-NOV-86	1605	L.40	L.40	L.40	L.40	L9.00

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	HCB	a-BHC	g-BHC LINDANE	HEPTA- CHLOR	ALDRIN	HEPTACHLOR EPOXIDE	g-CHLORDANE
00NF02ZM0009	705849	23-NOV-87	1415	L.4	0.60	L.4	L.4	L.4	L.4	L.4
00NF02ZM0009	805133	05-MAY-88	1315	L.4	0.96	L.4	L.4	L.4	L.4	L.4
00NF02ZM0015	705821	28-NOV-86	1300	L.40	2.32	0.96	L.40	L.40	L.40	L.40
00NF02ZM0015	705848	23-NOV-87	1240	L.4	1.40	0.50	L.4	L.4	L.4	L.4
00NF02ZM0015	805173	30-MAY-88	1210	L.4	0.74	0.63	L.4	L.4	L.4	L.4
00NF02ZM0015	805174	30-MAY-88	1215	L.4	0.97	1.03	L.4	L.4	L.4	L.4
00NF02ZM0017	705819	27-NOV-86	1330	L.40	1.26	L.40	L.40	L.40	L.40	L.40
00NF02ZM0017	705845	17-NOV-87	1417	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0017	805105	04-MAY-88	1505	L.4	0.50	L.4	L.4	L.4	L.4	L.4
00NF02ZM0018	705814	18-NOV-86	1130	L.40	1.39	L.40	L.40	L.40	L.40	L.40
00NF02ZM0018	705815	18-NOV-86	1135	L.40	1.64	L.40	L.40	L.40	L.40	L.40
00NF02ZM0018	705844	17-NOV-87	1300	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0018	805104	04-MAY-88	1345	L.4	0.60	L.4	L.4	L.4	L.4	L.4
00NF02ZM0019	705816	18-NOV-86	1355	L.40	3.06	0.53	L.40	L.40	L.40	L.40
00NF02ZM0019	705753	09-NOV-87	1230	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0019	805172	26-MAY-88	1345	L.4	0.99	L.4	L.4	L.4	L.4	L.4
00NF02ZM0020	705820	28-NOV-86	1150	L.40	2.00	L.40	L.40	L.40	L.40	L.40
00NF02ZM0020	705846	20-NOV-87	1150	L.4	1.40	L.4	L.4	L.4	L.4	L.4
00NF02ZM0020	705847	20-NOV-87	1155	L.4	1.60	L.4	L.4	L.4	L.4	L.4
00NF02ZM0020	805132	06-MAY-88	1220	L.4	0.54	1.59	L.4	L.4	L.4	L.4
00NF02ZN0004	705838	26-NOV-87	1100	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZN0004	805136	16-MAY-88	1520	L.4	1.12	L.4	L.4	L.4	L.4	L.4
00NF02ZN0004	805137	16-MAY-88	1525	L.4	1.27	L.4	L.4	L.4	L.4	L.4

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	a-CHLOR- DANE	a-ENDO- SULFAN	PP-DDE	HEOD/ DIELDRIN	ENDRIN	OP-DDT	PP-TDE
00NF02ZM0009	705849	23-NOV-87	1415	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0009	805133	05-MAY-88	1315	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0015	705821	28-NOV-86	1300	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZM0015	705848	23-NOV-87	1240	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0015	805173	30-MAY-88	1210	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0015	805174	30-MAY-88	1215	L.4	L.4	L.4	0.43	L.4	L.4	L.4
00NF02ZM0017	705819	27-NOV-86	1330	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZM0017	705845	17-NOV-87	1417	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0017	805105	04-MAY-88	1505	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0018	705814	18-NOV-86	1130	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZM0018	705815	18-NOV-86	1135	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZM0018	705844	17-NOV-87	1300	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0018	805104	04-MAY-88	1345	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0019	705816	18-NOV-86	1355	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZM0019	705753	09-NOV-87	1230	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0019	805172	26-MAY-88	1345	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0020	705820	28-NOV-86	1150	L.40	L.40	L.40	L.40	L.40	L.40	L.40
00NF02ZM0020	705846	20-NOV-87	1150	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0020	705847	20-NOV-87	1155	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZM0020	805132	06-MAY-88	1220	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZN0004	705838	26-NOV-87	1100	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZN0004	805136	16-MAY-88	1520	L.4	L.4	L.4	L.4	L.4	L.4	L.4
00NF02ZN0004	805137	16-MAY-88	1525	L.4	L.4	L.4	L.4	L.4	L.4	L.4

TABLE 3: OC-PCB'S RESULTS (NG/L) OF THE WATER SAMPLES FROM THE INDEX STATION NETWORK
OF THE CANADA-NEWFOUNDLAND AGREEMENT: 1986 TO 1988

STATION #	SAMPLE #	DATE	TIME	PP-DDT	b-ENDO SULFAN	MIREX	METHOXY CHLOR	TOTAL PCB'S
00NF02ZM0009	705849	23-NOV-87	1415	L.4	L.4	L.4	L.4	11.8
00NF02ZM0009	805133	05-MAY-88	1315	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0015	705821	28-NOV-86	1300	L.40	L.40	L.40	L.40	L9.00
00NF02ZM0015	705848	23-NOV-87	1240	L.4	L.4	L.4	L.4	16.0
00NF02ZM0015	805173	30-MAY-88	1210	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0015	805174	30-MAY-88	1215	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0017	705819	27-NOV-86	1330	L.40	L.40	L.40	L.40	L9.00
00NF02ZM0017	705845	17-NOV-87	1417	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0017	805105	04-MAY-88	1505	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0018	705814	18-NOV-86	1130	L.40	L.40	L.40	L.40	L9.00
00NF02ZM0018	705815	18-NOV-86	1135	L.40	L.40	L.40	L.40	L9.00
00NF02ZM0018	705844	17-NOV-87	1300	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0018	805104	04-MAY-88	1345	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0019	705816	18-NOV-86	1355	L.40	L.40	L.40	L.40	L9.00
00NF02ZM0019	705753	09-NOV-87	1230	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0019	805172	26-MAY-88	1345	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0020	705820	28-NOV-86	1150	L.40	L.40	L.40	L.40	L9.00
00NF02ZM0020	705846	20-NOV-87	1150	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0020	705847	20-NOV-87	1155	L.4	L.4	L.4	L.4	L9.0
00NF02ZM0020	805132	06-MAY-88	1220	L.4	L.4	L.4	L.4	L9.0
00NF02ZN0004	705838	26-NOV-87	1100	L.4	L.4	L.4	L.4	L9.0
00NF02ZN0004	805136	16-MAY-88	1520	L.4	L.4	L.4	L.4	L9.0
00NF02ZN0004	805137	16-MAY-88	1525	L.4	L.4	L.4	L.4	L9.0